



Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 290
Sodium Thiosulfate

Issued: 4/90

Section 1. Material Identification

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Sodium Thiosulfate Description: Derived by dissolving sulfur in sodium sulfite solution and then crystallizing it. Used as a reducer in chrome dyeing, a mordant in dyeing and printing textiles, a reagent in analytical chemistry, a photographic agent to dissolve silver halide, an agent in chrome dyeing and leather tanning, a preservative, a source of sulfur dioxide in bleaching various products, an antidote for cyanide poisoning, Antichlor in bleaching of paper pulp; to remove chlorine from solution.

Other Designations: CAS No. 7772-98-7; $\text{Na}_2\text{S}_2\text{O}_3$; sodium hyposulfite; sodium oxide sulfide; disodium thiosulfate; Sulfothiorine; hypo; Antichlor; Sodothiol.

Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*^(TM) for a suppliers list.

R 0
I -
S 2
K 0

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HMIS

H 2

F 0

R 0

PPG*

* Sec. 8

Section 2. Ingredients and Occupational Exposure Limits

Sodium thiosulfate, ca 100%

OSHA PEL

None established

ACGIH TLV, 1989-90

None established

NIOSH REL, 1987

None established

Toxicity Data*

Frog, subcutaneous, LD_{50} : 6 g/kg

Rabbit, subcutaneous, LD_{50} : 4 g/kg

* Monitor NIOSH, RTECS (XN6476000), for future data.

Section 3. Physical Data

Boiling Point: 212 °F/100 °C

Melting Point: 118 °F/48 °C

Molecular Weight: 158.13 g/mol

Specific Gravity ($\text{H}_2\text{O} = 1$ at 39 °F/4 °C): 1.69

Water Solubility: Soluble in 0.5 part water

pH: Aqueous solutions, neutral, 6.5 to 8

Appearance and Odor: White, transparent powder or crystals; almost odorless, salty taste.

Section 4. Fire and Explosion Data

Flash Point: None reported

Autolignition Temperature: None reported

LEL: None reported

UEL: None reported

Extinguishing Media: This material is noncombustible. Use extinguishing media appropriate to the surrounding fire.

Unusual Fire or Explosion Hazards: An explosion may occur if this material is ground with oxidizing agents such as nitrate, potassium permanganate, or potassium chlorate. When a mixture of sodium nitrite and thiosulfate was heated to dryness, a violent explosion occurred.

Special Fire-fighting Procedures: Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode. Be aware of runoff from fire control methods. Do not release to sewers or waterway.

Section 5. Reactivity Data

Stability/Polymerization: Sodium thiosulfate is stable at room temperature in closed containers under normal storage and handling conditions. solution this material may be unstable if exposed to light. It decomposes slowly at room temperature and more rapidly when heated. When mixed with 1.21% sodium phosphate dodecahydrate, its injectable form is stable for up to three years. Hazardous polymerization cannot occur.

Chemical Incompatibilities: This material is incompatible with sodium nitrite, metal nitrates, acids, iodine, mercury, lead, and silver salts.

Sodium thiosulfate is a strong reducing agent and can react with oxidizers. An explosion can occur if sodium thiosulfate is ground with chlorate permanganates, or nitrates.

Hazardous Products of Decomposition: Thermal oxidative decomposition of sodium thiosulfate can produce sodium oxide (Na_2O) and sulfur oxides (SO_x).

Section 6. Health Hazard Data

Carcinogenicity: Neither the NTP, IARC, nor OSHA lists sodium thiosulfate as a carcinogen.

Summary of Risks: Solid sodium thiosulfate is a mild irritant and relatively nontoxic *in vivo*. This material is moderately toxic by subcutaneous (under the skin) route and can cause allergic dermatitis. Ingestion can cause gastrointestinal disturbances. Poorly absorbed from the intestinal tract, it acts as an osmotic cathartic, with resultant diarrhea and abdominal cramping. The lethal oral dose for a human is probably 0.5 to 5 g/kg, approximately a pound for a 150-lb person. Large amounts of sodium thiosulfate administered by rapid intravenous infusion have caused EKG changes, metabolic acidosis (decreased alkalinity of the blood and tissues), hypernatremia (elevated serum sodium level), and transient hypotension (abnormally low blood pressure) in dogs. It has been used safely for intravenous treatment of cyanide poisoning.

Medical Conditions Aggravated by Long-Term Exposure: None reported.

Target Organs: Skin, eyes, mucous membranes, upper respiratory tract, gastrointestinal tract.

Primary Entry Routes: Inhalation, ingestion.

Acute Effects: Inhalation can irritate the mucous membranes and upper respiratory tract. Ingesting large amounts can cause nausea, vomiting, abdominal cramping, diarrhea, and gastrointestinal irritation. Concentrated solutions and dust can irritate the skin and cause allergic contact dermatitis.

Chronic Effects: Repeated skin contact can cause chronic dermatitis.

FIRST AID

Eyes: Flush immediately, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 min.

Skin: Quickly remove contaminated clothing. After rinsing affected skin with flooding amounts of water, wash it with soap and water.

Inhalation: Remove exposed person to fresh air and support breathing as needed.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, have a conscious person drink 1 to 2 glasses of water, then induce repeated vomiting until vomit is clear. Vomiting is most effective when initiated within 30 min.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Physician's Note: If hypotension occurs, consider administering IV fluids and placing the person in the Trendelenburg position. If no response occurs, consider administering 0.1 to 0.2 mcg/kg/min norepinephrine or 2 to 5 mcg/kg/min dopamine and titrating as needed to the desired response.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel of spilled material and provide adequate ventilation. Cleanup personnel should wear personal protective gear against dust inhalation and skin contact. Scoop spilled material into appropriate disposal containers. Follow applicable OSHA regulations (29 CFR 1910.120).

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations

RCRA Hazardous Waste (40 CFR 261.33): Not listed

CERCLA Hazardous Substance (40 CFR 302.4): Not listed

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SARA Toxic Chemical (40 CFR 372.65): Not listed

OSHA Designations

Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent repeated or prolonged skin contact.

Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.⁽¹⁰⁹⁾

Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in closed containers in a cool, dry, well-ventilated area away from incompatible materials (Sec. 5).

Engineering Controls: Avoid dust inhalation and skin contact. Practice good personal hygiene and housekeeping procedures.

Transportation Data (49 CFR 172.101, .102): Not listed

MSDS Collection References: 7, 73, 84, 103, 109, 124, 126, 136

Prepared by: MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CH; **Medical Review:** W Silverman, MD

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DO A 022008
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